CLAIMS

1. A delivery catheter, comprising:

(a) a first elongated member defining a first distal opening and a first lumen extending within the first elongated member, the first elongated member for delivering a first material through the first lumen and into a distal section of the first lumen near the first distal opening; and

(b) a second elongated member comprising a distal valve and a second lumen extending within the second elongated member, the second elongated member for delivering a second material through the second lumen and the distal valve, at least a portion of the second elongated member being slidably disposed within at least a portion of the first lumen such that the distal valve is selectively slidable

(i) to allow delivery of the second material through the second lumen and the distal valve and into the distal section, and

(ii) to push at least some of the first and second materials from the distal section and out of the first distal opening.

2. The catheter of claim 1 wherein the distal valve comprises a one-way flow-control valve.

3. The catheter of claim 2 wherein the one-way flow-control valve comprises a slit that opens and closes upon pressure differentiation between the second lumen and the distal section to regulate delivery of the second material into the distal section.

4. The catheter of claim 3 wherein the slit opens to a size of about 0.00001 mm^2 to about 100 mm^2.

5. The catheter of claim 1 wherein one of the first and second lumens has a diameter of about 0.001 mm to about 20 mm.

6. The catheter of claim 1 further comprising:

(c) a first pump connected to the first elongated member for delivering the first material into the first lumen; and

(d) a second pump connected to the second elongated member for delivering the second material into the second lumen.

7. The catheter of claim 6 wherein each of the first and second pumps comprises a syringe.

8. The catheter of claim 1 wherein the first elongated member further defines a first proximal port, and the second elongated member further defines a second proximal port.

9. The catheter of claim 8 further comprising an access joint between a first proximal joint and the first distal opening, the access joint allowing insertion of the at least a portion of the second elongated member into the at least a portion of the first lumen.

10. The catheter of claim 9 wherein the access joint is Y-shaped.

11. The catheter of claim 9 wherein the access joint is T-shaped.

12. The catheter of claim 1 further comprising a stabilizer to keep the second elongated member substantially co-axial with the first elongated member.

13. The catheter of claim 12 wherein the stabilizer comprises two or more legs peripherally placed between an annular wall of a distal segment of the first elongated member and an annular wall of a distal segment of the second elongated member.

14. The catheter of claim 1 wherein the selectively slidable distal valve is alternatively positionable outside the first lumen and outside the first distal opening.

15. The catheter of claim 1 wherein at least one of the first and second elongated members has a length from about 1 cm to 3 m.

16. A method for delivering an extrudable material within a body of a mammal, the method comprising the steps of:

(a) providing a delivery catheter, the delivery catheter comprising:

(1) a first elongated member defining a first distal opening and a first lumen extending within the first elongated member, the first elongated member for delivering a first material through the first lumen and into a distal section of the first lumen near the first distal opening; and

(2) a second elongated member comprising a distal valve and a second lumen extending within the second elongated member, the second elongated member for delivering a second material through the second lumen and the distal valve, at least a portion of the second elongated member being slidably disposed within at least a portion of the first lumen such that the distal valve is selectively slidable

(i) to allow delivery of the second material through the second lumen and the distal valve and into the distal section, and

(ii) to push at least some of the first and second materials from the distal section and out of the first distal opening; and

(b) extruding a fibrous material out of the distal section and into the body of a mammal.

17. The method of claim 16 wherein step (b) comprises

i. delivering the first material comprising a crosslinking agent to the distal section through the first lumen; and

ii. delivering the second material comprising a crosslinkable polymer to the distal section through the second lumen, thereby forming a fibrous material in the distal section.

18. The method of claim 16 wherein the distal valve comprises a one-way flow-control valve.

19. The method of claim 17 wherein the first material surrounds the second material when the second material enters the distal section.

20. The method of claim 18 wherein step (b) comprises cutting the fibrous material by operating the valve.

21. The method of claim 17 further comprising the step of:

iii. pushing the fibrous material out of the distal section by sliding distally and longitudinally the distal valve into the distal section.

22. The method of claim 18 wherein step (b) comprises terminating the delivery of either the first material or the second material thereby terminating formation of the fibrous material.

23. The method of claim 17 wherein at least one of the first and second materials further comprises a bioadhesive agent.

24. The method of claim 23 wherein the bioadhesive agent is selected from a group consisting essentially of collagen, laminin, fibronectin, poly-D-lysine, poly-L-lysine, decapeptides.

25. The method of claim 17 wherein the crosslinking agent comprises an ionic crosslinker.

26. The method of claim 25 wherein the crosslinking agent comprises a polycationic crosslinker.

27. The method of claim 26 wherein the polycationic crosslinker comprises a calcium ion.

28. The method of claim 17 wherein the crosslinkable polymer comprises an alginate.

29. The method of claim 16 further comprising the step of positioning the distal section of the catheter within the body of a mammal.

30. The method of claim 17 wherein the steps of delivering the first and second materials are sustained so as to form a fibrous material within the distal section and extrude the fibrous material out of the distal section and into the body of a mammal.